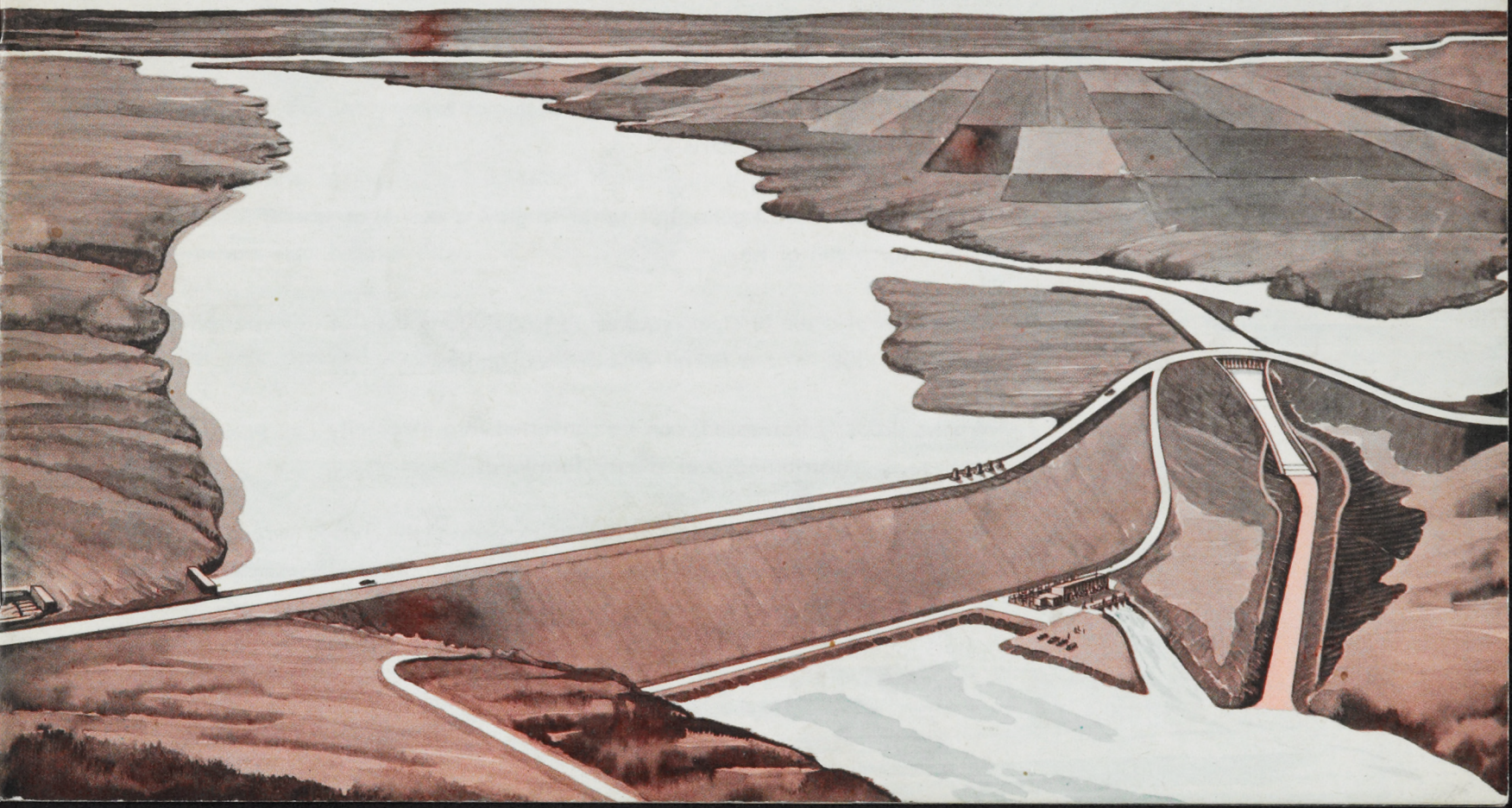


Harnessing

THE SOUTH SASKATCHEWAN



WATER — A VITAL RESOURCE

Water is the first essential of life . . . for human beings, animals and plants . . . for cities and industries!

It takes up to 30,000 gallons of water to grow a bushel of wheat; 500,000 gallons for a ton of hay.

Production of a ton of steel requires up to 65,000 gallons of water, a ton of paper—39,000; and a barrel of oil—770 gallons.

Water, properly harnessed, can be converted into electricity . . . piped into homes . . . distributed over thirsty farmlands.

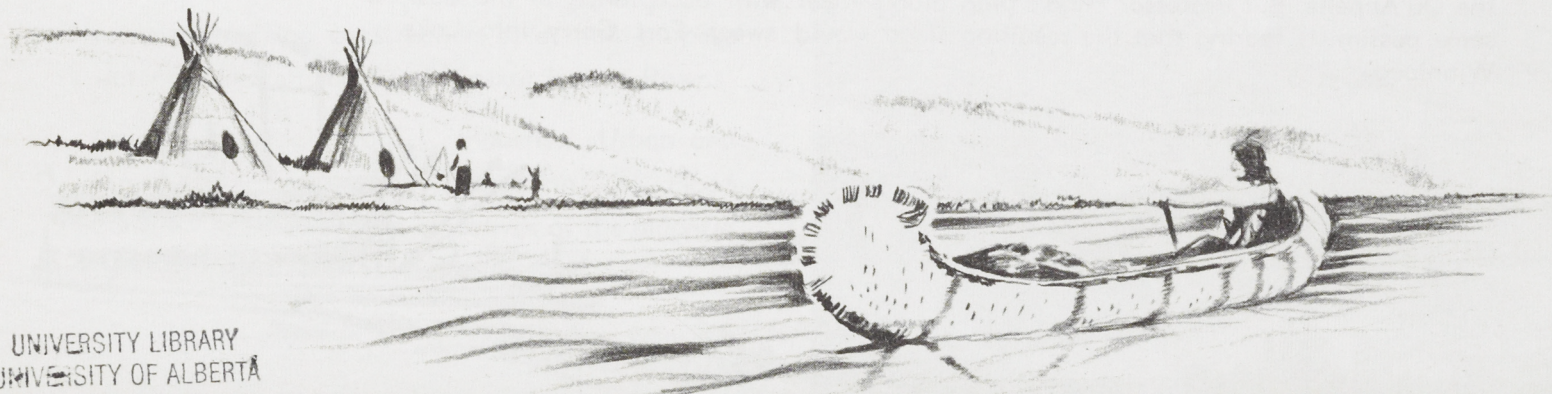
The people of southern Saskatchewan, knowing the havoc wrought by drought and drifting soil, are now looking to the broad South Saskatchewan to help supply the ever-increasing demands of agriculture and industry—for water!

RIVER THAT FLOWS SWIFTLY

From the glaciers of the Rocky Mountains, torrential streams spill down the slopes; onto the southern slopes, and cross the Alberta plains. Mid way between Lethbridge and Medicine Hat, two rivers meet, the Oldman and Bow, to form the South Saskatchewan River.

Between steep banks it flows eastward through dry prairie land until, half-way across Saskatchewan, it veers north to join the North Saskatchewan. The united river then flows to Lake Winnipeg which empties its waters into Hudson Bay.

The Indians called it "Kisiskatchewan"—the river that flows swiftly—and long before the white man came they paddled its wide waterways toward the mountains and the setting sun.

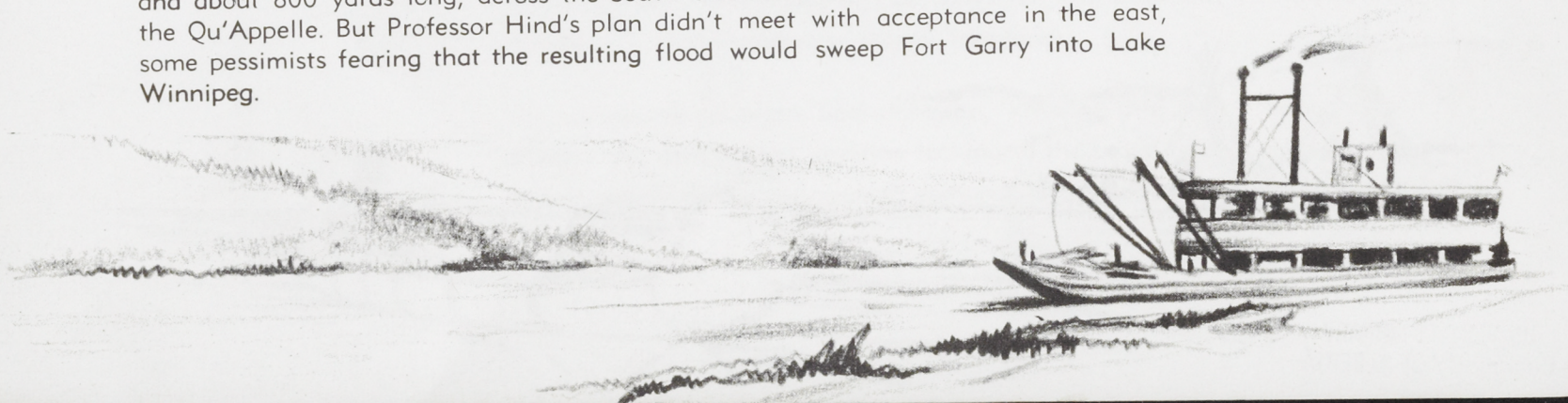


EXPLORER'S DREAM

Later, explorers and fur traders penetrated the untamed west via the Saskatchewan's twin waterways . . . and a dream took shape in men's minds.

When Captain John Palliser's expedition (1857-1860) reached the South Saskatchewan, he dismissed the surrounding drought-ridden prairie as desert. But he did envision the river as a potential navigation route from Fort Garry to the foot of the Rockies—if the South Saskatchewan could be channeled into the Qu'Appelle River.

On Palliser's heels came the man who first dreamed of a dam on the river. Henry Hind, explorer and geologist, was instructed by the Canadian government to investigate the proposed prairie steamship route. On a summit of land near the elbow of the South Saskatchewan, Professor Hind saw the "River That Turns"—as the Indians called the small creek which reversed its flow at high water and connected the elbow to the Qu'Appelle Valley. He then proposed building a dam, 80 feet high and about 800 yards long, across the South Saskatchewan to divert its waters into the Qu'Appelle. But Professor Hind's plan didn't meet with acceptance in the east, some pessimists fearing that the resulting flood would sweep Fort Garry into Lake Winnipeg.



THE SOUTH SASKATCHEWAN RIVER DEVELOPMENT PROJECT

At the turn of the century, Regina and Moose Jaw proposed a dam on the South Saskatchewan River to divert water to Buffalo Pound Lake. In 1911 Regina's Commissioner of Health applied to the federal Commissioner of Irrigation in Calgary for permission to divert 100 million gallons of water daily from the river; and in 1919 another plan was submitted to the Saskatchewan government. Engineering problems and lack of money shelved these projects.

Dreams of a dam on the river revived again with the wind and dust of the "thirties".

By 1944, the Prairie Farm Rehabilitation Administration of the federal government had started the search for a suitable dam site.

On July 25, 1958, the Governments of Canada and Saskatchewan signed the long-sought agreement authorizing construction of a multi-purpose water project on the South Saskatchewan River.

Power . . . Irrigation . . . Industrial, Urban and Rural Water Supply . . . Recreation . . . Flood Control . . . these are the objectives of the gigantic South Saskatchewan River Project.

River Closure, February, 1964,
South Saskatchewan Dam



MULTI-PURPOSE STRUCTURE

THE RESERVOIR WORKS call for the construction of two dams—the South Saskatchewan River Dam, where Coteau Creek enters the South Saskatchewan River, and the Qu'Appelle River Dam across the Qu'Appelle Valley some 12 miles south-east of Elbow. The main dam, 210 feet high, with an overall length of 16,700 feet, will be the largest rolled-earth dam ever built in Canada and among the largest of its kind in the world.

THE FEDERAL GOVERNMENT, through the Prairie Farm Rehabilitation Administration, is responsible for carrying out the construction of the reservoir works, except relocation of certain provincial services. The total cost of the reservoir works, estimated at \$112 million, will be shared by the two governments—75 per cent by the federal government and 25 per cent by the province. Saskatchewan's share of these works has been limited by agreement to \$25 million.

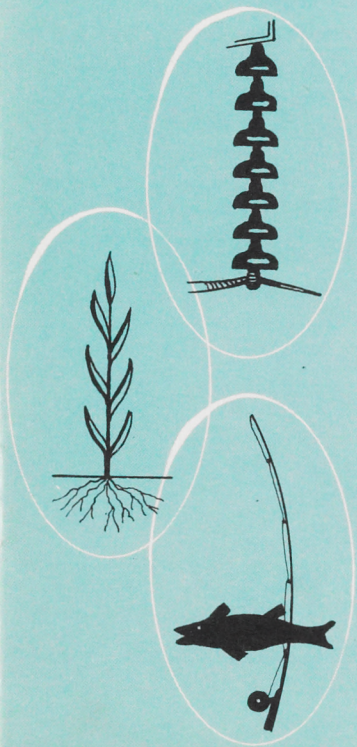
POWER—The province is responsible for the development of hydro-electric power associated with the project including penstocks and power plant at the main dam and transmission system tying in with the provincial grid. The power plant, which will be located on the downstream toe of the main dam on the west side, will be developed in two stages. The first stage—now in progress—will consist of three turbo-generators with a combined rating of 250,000 h.p. The cost of the power plant and associated works for this stage is estimated at \$26 million. At some future date it will be possible to add two similar units giving the site an ultimate capacity of 400,000 h.p.

IRRIGATION—Works will consist of pumping stations, main canal systems, a number of secondary reservoirs and the distribution system connecting the main canal with the individual irrigation farms. The development of 200,000 acres of irrigable land located on both the east and west sides of the river downstream from the main dam will be a provincial responsibility. Full development of all potential irrigable acreage will extend over a considerable period of time.

RECREATION—Three provincial parks are now under development at locations widely spaced along the shoreline of the reservoir. An extensive afforestation program is under way, and a wide variety of other recreation facilities are now in the planning stage. Development of the great recreation potential will involve heavy expenditures of public and private funds over a number of years. The province's investment in recreation development may eventually exceed \$15 million.

INDUSTRIAL AND MUNICIPAL WATER SUPPLY—A reliable supply of water will be available to communities and industries within reach of the reservoir and may be brought to more distant parts of southern Saskatchewan by diversion of reservoir water down the Qu'Appelle.

FLOOD CONTROL—Regulating capacity of the reservoir will permit flood flows on the river to be controlled. This should reduce the cost of reclaiming some 500,000 acres of potentially valuable farming land in the Saskatchewan Delta.

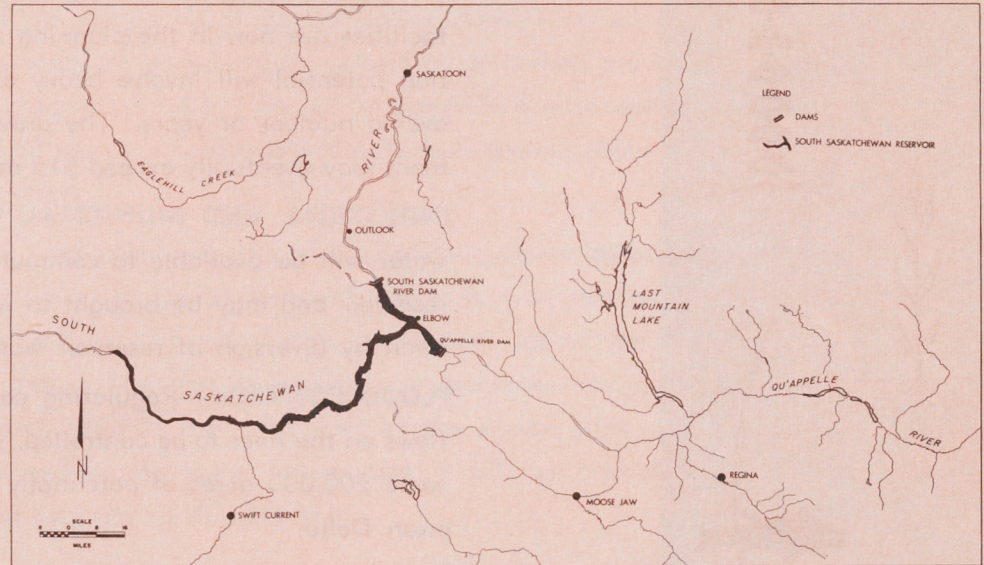


CONSTRUCTION PROGRAM

CONSTRUCTION OF THE DAMS and other works necessary to create the South Saskatchewan Reservoir began late in 1958 and is expected to be completed by the fall of 1966. Thereafter the reservoir will take one or more years to fill depending upon river flows.

When completed, the main dam, located on the South Saskatchewan River 20 miles south of Outlook, will be the largest rolled-earth dam in Canada. Construction of the Qu'Appelle River Dam, located about 30 miles south-east of the main dam, began late in 1963. This structure is required to prevent the water impounded by the reservoir from escaping down the Qu'Appelle Valley.

LOCATION OF SOUTH SASKATCHEWAN PROJECT



RESERVOIR CONSTRUCTION STATISTICS

● SOUTH SASK. RIVER DAM

Height 210 feet
Length—overall 16,700 feet
Width at base 5,300 feet
Vol. of embankment 73,000,000 cu. yds.
Vol. of excavation 105,000,000 cu. yds.
Vol. of concrete 620,000 cu. yds.
Vol of rip-rap 400,000 cu. yds.

● SPILLWAY

Type—Gate controlled concrete chute
Length of chute 3,830 feet
Length of crest 528 feet
Discharge capacity 265,000 c.f.s.

● DIVERSION WORKS

Type Tunnels
No. of tunnels 5
Average length 4,300 feet
Size of tunnels 20 ft. dia.

● RESERVOIR

Area 109,600 acres
Total storage 8,000,000 ac. ft.
Usable storage 2,750,000 ac. ft.
Length of shoreline 475 miles
Length of reservoir 140 miles
Depth of water at dam 182 feet

● QU'APPELLE RIVER DAM

Height 90 feet
Length 10,200 feet
Width at base 1,900 feet
Vol. of embankment 14,000,000 cu. yds.
Vol. of rip-rap 350,000 cu. yds.

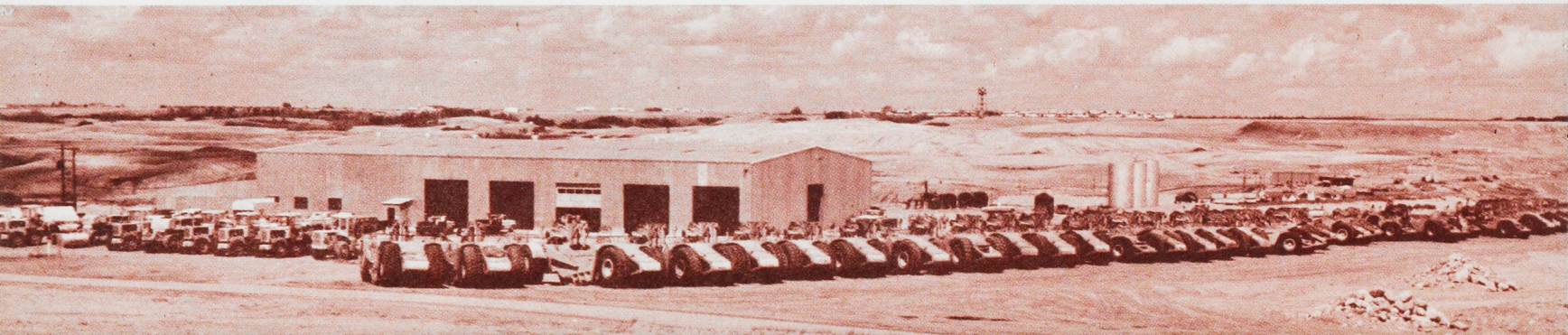


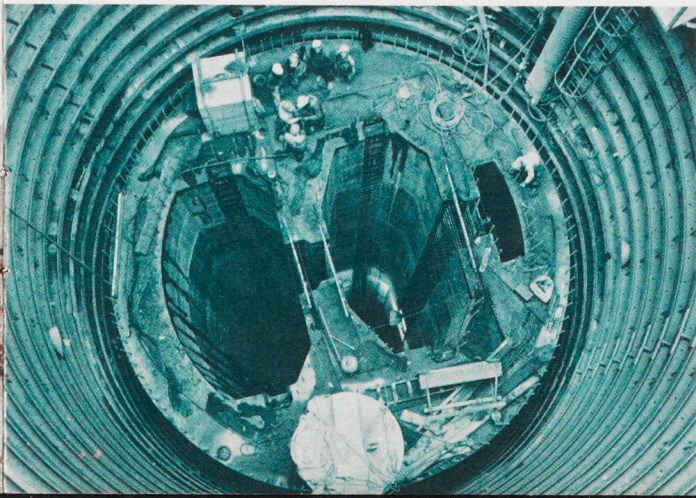
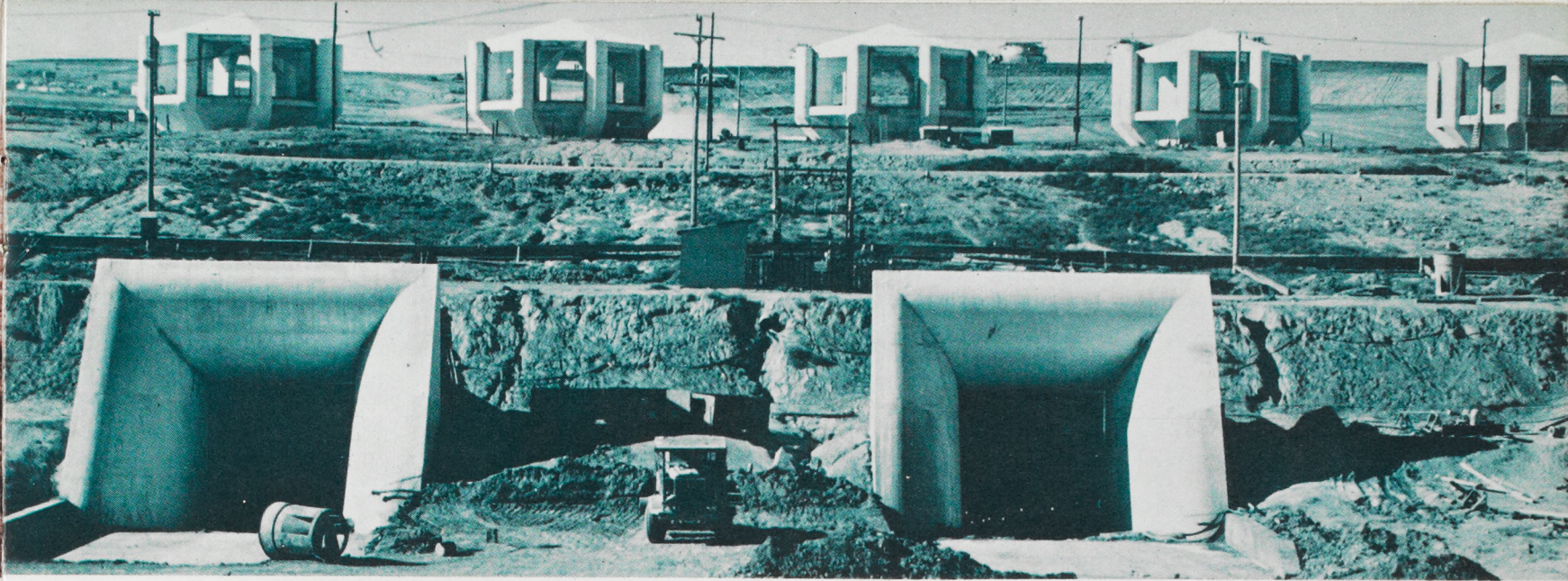
South Saskatchewan Dam Site ▲



▲ P.F.R.A. Headquarters Site

▼ Earth-moving Equipment





▲
Intakes to Diversion
Tunnels Prior to
River Closure
in 1964

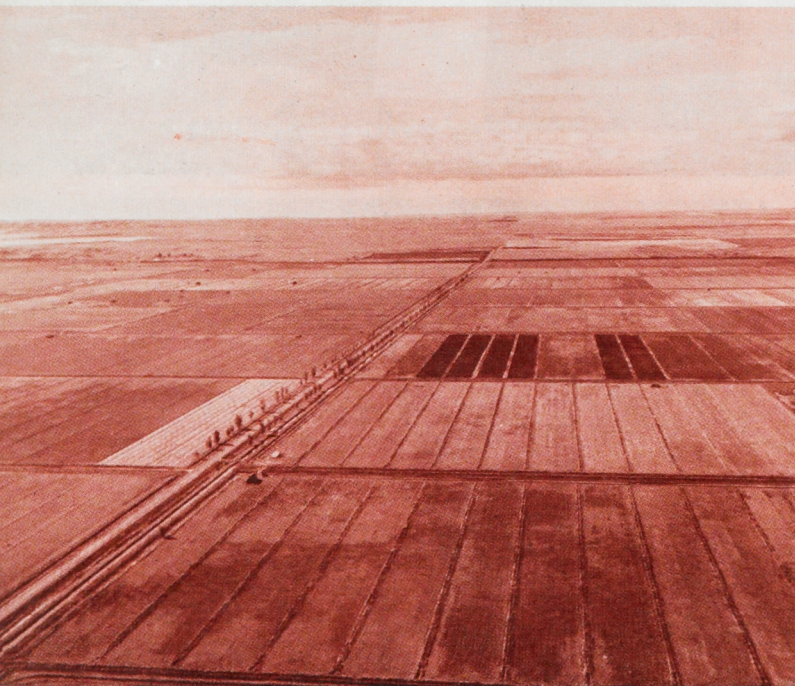
Control Gates ▶

◀ Control Shafts



FROM DRYLAND FARMING TO IRRIGATION

STUDY OF THE IRRIGATION PROPOSAL was begun in 1959 by the Saskatchewan Department of Agriculture. In conjunction with the Saskatchewan Soil Survey and the P.F.R.A. Drainage Division, the Department studied in considerable detail both surface and sub-surface soils and the topography in potential irrigable areas.



The soil survey covered 2.5 million acres with detailed analysis of over 30,000 soil samples. The topography surveys covered 600,000 acres. By the end of 1962, the information had been brought together to delineate the area and establish the acreage considered suitable for irrigation.

Three main blocks of land, totalling about 200,000 acres in all, have been selected for irrigation. These are shown in the map on the centre page. This acreage was selected on the basis of fairly rigid standards. With improvements in the economics of irrigation and irrigation technology, considerable additional acreage may become irrigable in the future.

ALTERNATIVE ROUTES and the costs of conveying water from the reservoir to the irrigable areas have been investigated and preliminary designs of the irrigation system prepared. Water will be pumped from the reservoir into high-level main canals and then flow by gravity via smaller distribution canals to the farm turnouts and farm lands.

IRRIGATION WILL LIKELY BE DEVELOPED

on the east side of the river downstream from the South Saskatchewan Dam. The initial area contains about 40,000 acres of irrigable land. Later, as the project develops, large additional acreages on the west side of the river between Outlook and Saskatoon will be included.

THE TRANSITION FROM DRYLAND FARMING to irrigation will not take place overnight. While some farms will convert rapidly, others will increase their irrigable acreage by stages until the change-over is complete.

Initially, forage crops and coarse grains for livestock are expected to predominate. More specialized crops will come later depending largely upon markets. As these crops are developed, dehydrating plants, quick-freeze and canning plants, and a sugar refinery may be built in the area.



DETAIL OF
RESERVOIR AND
IRRIGABLE AREAS





LEGEND

AGRICULTURE



IRRIGABLE AREAS



SASKATCHEWAN DELTA AREA

POWER



COMPLETED



UNDER CONSTRUCTION



POTENTIAL

RECREATION



PROPOSED PROVINCIAL PARKS

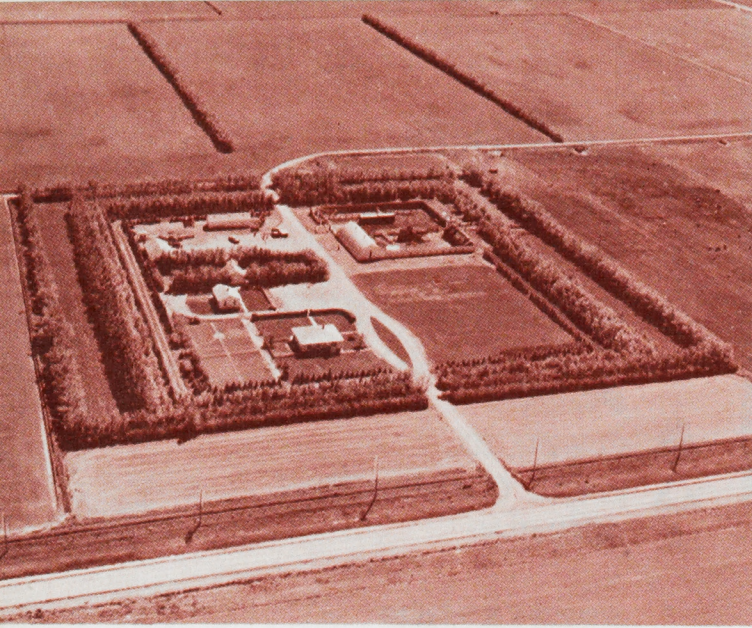


OTHER PROPOSED PARKS



QU'APPELLE DIVERSION

INDUSTRIAL, MUNICIPAL
WATER SUPPLY,
RECREATION, IRRIGATION



THE PRE-DEVELOPMENT FARM at Outlook was established by P.F.R.A. in 1949. Located in the heart of the area selected for irrigation, it is a demonstration and proving ground for irrigation methods, practices, kinds of crops and yields, under the prevailing soil and climatic conditions. Emphasis is placed upon forage, the initial type of production expected in the area.

A RESEARCH PROGRAM jointly sponsored by the Saskatchewan Department of Agriculture and the University of Saskatchewan has resulted in 240 acres on the university grounds being transformed into model irrigation units. Agriculture students and extension personnel study all phases of irrigation, engineering and water control. Valuable information is gained on effects of irrigation on Saskatchewan soils, methods of harvesting feed, carrying capacity of pastures, planned water budgets for irrigated lands, and irrigated cropping. Research into methods of water handling on irrigated farms is one of the most urgent objectives.

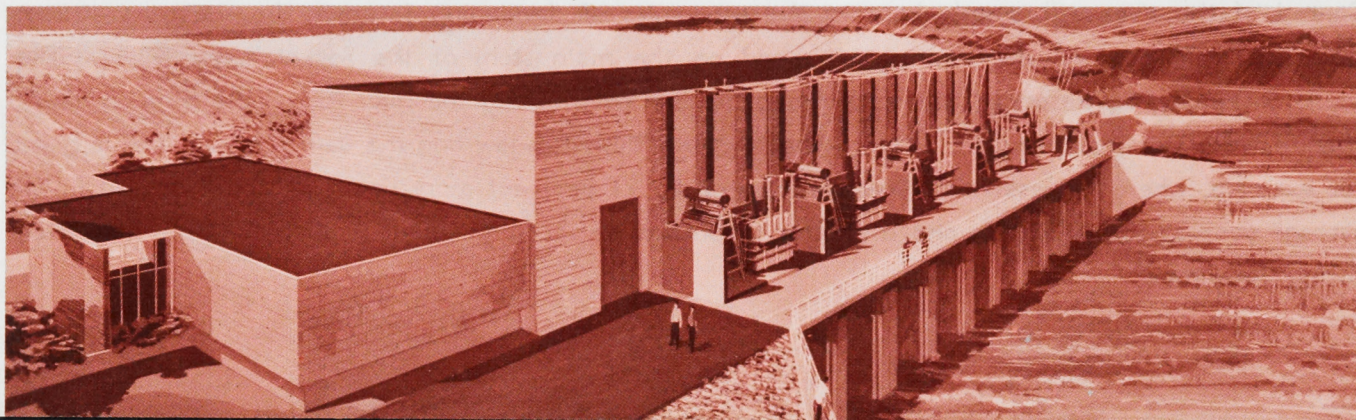
POWER BENEFITS...

WORK BEGAN on the first stage of power development in 1960 and is being carefully timed to the progress of construction on the dams and reservoir. This first stage will use three of the five diversion tunnels at the main dam. Later a second stage using the remaining two tunnels will bring the size of the plant to 400,000 h.p.

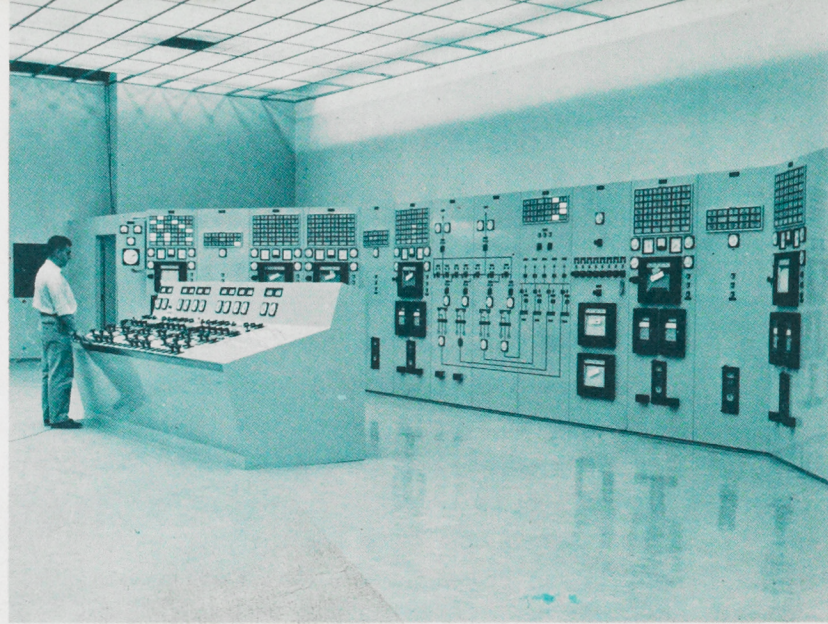
Between 1960 and the end of 1963, steel tunnel liners were installed in the three diversion tunnels designed to serve as power penstocks. Construction of the power house itself is scheduled for the period 1966 to 1969. It is expected that the first power from this, the province's second major hydro development, will be produced in 1968. When the plant is completed, 800 million kilowatt hours of electricity will be available in an average year, or more than one-third of the total power generated in the Saskatchewan Power Corporation in 1963.

This architect's drawing is preliminary, but is representative of the ultimate design and appearance of the Coteau Creek Hydro Electric Station.

Artist's Impression Power House



THE POWER INSTALLATION at the main dam will be integrated with the operation of a chain of hydro plants which may be constructed on the Saskatchewan River system to meet future growth in power demand. The first plant on this system, Squaw Rapids, began generating power in 1963. When all eight units are installed, this plant will generate about one billion kilowatt hours in an average year.



Control of the river will greatly improve the economics of developing future hydro sites downstream from the main dam on the south branch and on the main stem of the Saskatchewan River. The South Saskatchewan Reservoir will store the peak summer flows of the river for release through downstream hydro stations during the winter, when natural flows are low and the demand for power is high. For example, when the reservoir comes into operation, 11 per cent more power will be produced in an average year at Squaw Rapids and a greater proportion of the total power available will be generated during the winter.

SIX POSSIBLE DAM SITES are under study between the South Saskatchewan Dam and Squaw Rapids, which if developed would utilize the entire head or drop in the river. The head available amounts to about 600 feet over a distance of some 300 miles. This plan would produce a chain of lakes, each extending back to the foot of the next dam upstream.



The downstream hydro plants, when fully developed, would have a combined installed capacity ten times that planned for the plant at the South Saskatchewan Dam. These plants would provide the added power necessary to meet the growing domestic and industrial needs of Saskatchewan. In addition, other benefits such as irrigation and recreation may be developed in association with the power reservoirs.

RECREATION FOR ALL...

A MAN-MADE LAKE 140 miles long and with a shoreline of nearly 500 miles, will be created when the reservoir is filled; a huge body of water in a part of the province where fresh water lakes are few.

The South Saskatchewan Reservoir will increase the usable aquatic resources of the southern part of the province by 75 per cent. This new water resource will relieve overcrowding at existing recreation sites, particularly those located on the Qu'Appelle chain of lakes and will be within easy reach of half the people of the province.

Boating, swimming, sports fishing, picnicking and camping are all expected to be popular pastimes when the lake is formed. Basic facilities will be ready in the provincial parks in time for the first recreation season, which is expected to be 1968.



THREE LARGE AREAS of the shoreline will become provincial parks, each with its own particular attractions.

At the main dam, a park will cater to visitors wishing to view the South Saskatchewan Dam and the associated power plant. Landscaping and afforestation will help to create a park-like atmosphere in and around the construction site after work is completed.

A second park, on the Qu'Appelle Arm of the lake, already has natural tree cover and it is expected that excellent sand beaches will be formed along the reservoir shoreline. The Qu'Appelle River Dam will be an added attraction for visitors to this park. Highway improvements scheduled for the next few years will mean that Saskatoon, a city with over 100,000 population, will have direct dust-free road access to either the Main Dam park or the Qu'Appelle Arm park and a travelling distance of only some 75 miles.

Towards the upper end of the lake, a park will be established in the valley of the South Saskatchewan amidst bold and attractive scenery. This park will be only thirty miles from the city of Swift Current and the Trans-Canada Highway.



IN ADDITION to the wide range of facilities which will be available in provincial parks, other sites will be developed by the province for boat launching, camping and picnicking. Regional and community parks will also be developed in co-operation with local people and with private organizations.

A MAJOR AFFORESTATION PROGRAM is under way to overcome the shortage of good forest shade and shelter around the shoreline of the lake. The lack of tree cover is perhaps the biggest handicap to recreation development. The provincial Department of Natural Resources expects to be planting 500,000 tree seedlings per year by 1966 in park areas.



The entire project has good potential for wildlife. The large water surface will provide a valuable resting area for migratory waterfowl. While some game species will be reduced by reservoir flooding, new tree plantations will offer suitable habitat for a variety of upland game.

QU'APPELLE DIVERSION

THE SOUTH SASKATCHEWAN PROJECT will make it possible to divert water from the South Saskatchewan basin into the Qu'Appelle basin. This will be vitally important to the future development of the economy of the populous south-eastern part of the province.

FOR INDUSTRIES—water from the reservoir will be a big factor in future development. The supply of water in adequate quantities is encouraging the development of resource-based industries—such as the potash industry. As basic industries multiply, so secondary and service industries will increase.

FOR TOWNS AND CITIES—South Saskatchewan water will provide an assured supply. To the water-short cities of Regina and Moose Jaw, water diverted into the Qu'Appelle and thence to Buffalo Pound Lake will firm-up supply. Diverted water may eventually be carried from the Qu'Appelle by pipeline to many urban communities in southern Saskatchewan.

FOR RECREATION—the Qu'Appelle chain of lakes and Last Mountain Lake presently form the nucleus of recreation in southern Saskatchewan. These lakes will be improved by clear water diverted from the reservoir to freshen them and stabilize their levels. Provincial parks already developed on these lakes will then become even more attractive.

A MIGHTY RIVER HARNESSED

WATER AND POWER from the South Saskatchewan Project will serve man's needs and will ensure a firm base for the growth of southern Saskatchewan, now rich in agricultural and mineral resources.

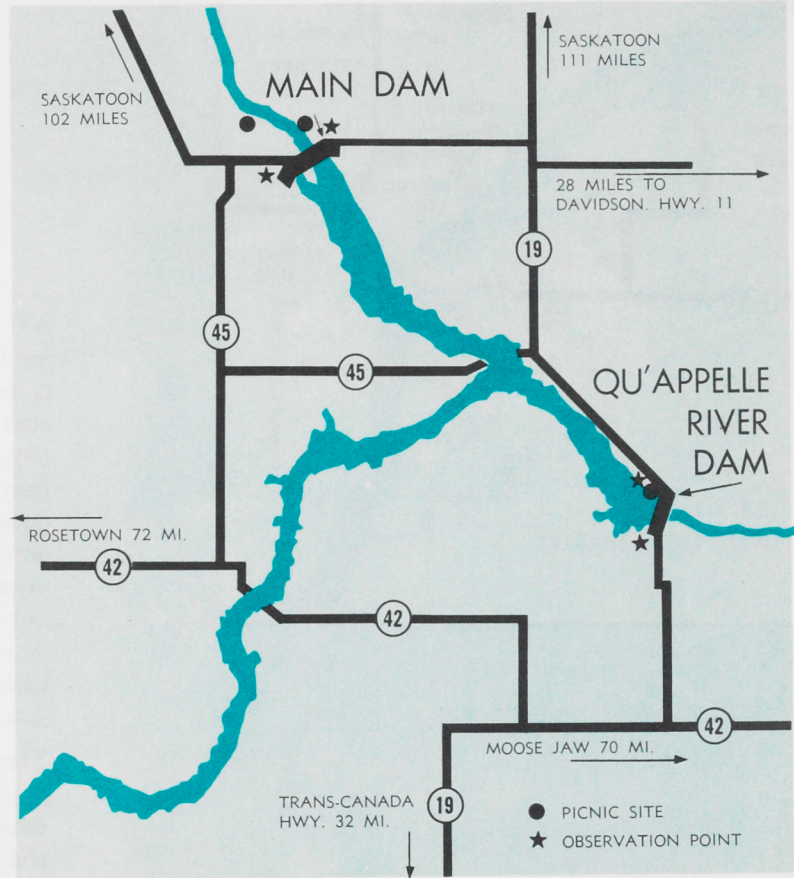
Already there are fears that the existing surface water supplies of the Saskatchewan system may be heavily taxed by demands within the province before the turn of the century. Taken in conjunction with the anticipated needs of Alberta and Manitoba, it is possible that the available flows in the Saskatchewan system will be insufficient to meet the needs of the three provinces; additional water may have to be brought in from adjacent river basins to meet the requirements.

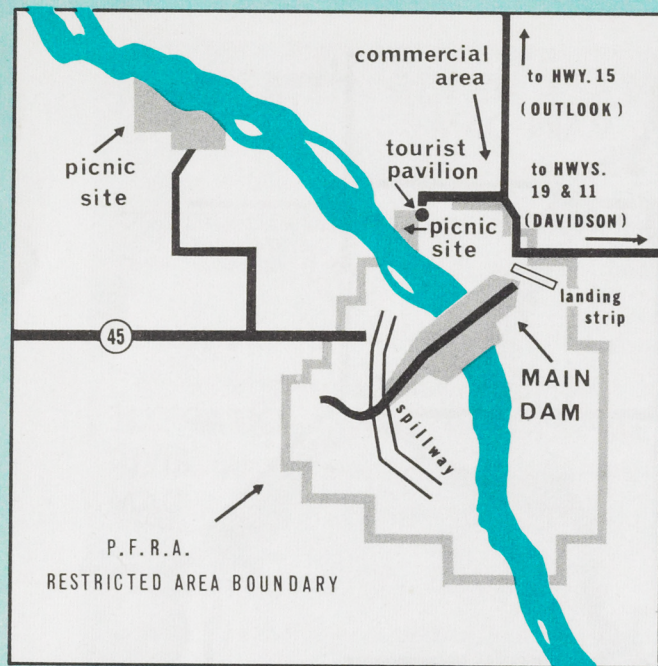
In this event, the position of the South Saskatchewan Reservoir as a key river control structure will be enhanced as the hub of a major water supply and distribution system.

THE SOUTH SASKATCHEWAN RESERVOIR will thus be an immeasurably valuable addition to the resources of the province and the nation.

VISITORS ARE WELCOME

THE CONSTRUCTION PHASE of the South Saskatchewan project has proved a major attraction for Saskatchewan people and for tourists from out-of-province. A number of facilities have been provided for the convenience of visitors to the construction areas, including an observation pavilion, public view-points, information panels and picnic sites. A detailed map of facilities at the main dam may be found over page.





AT THE MAIN DAM a tourist pavilion operated jointly by the federal and provincial governments is maintained during the summer season on the east side of the river. The pavilion contains displays, models and photographs relating to construction and other aspects of the project and affords a good vantage point from which to view construction activities. River closure in February, 1964, made it possible to construct a road across the river providing the public with a view of the construction area from both sides of the river and allowing a closer look at the water discharging from the tunnel outlets.

There is ample parking space associated with the pavilion and an air strip is located nearby. Well developed picnic areas have also been provided for the convenience of the visiting public on both sides of the river.

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